

the honeycomb, thereby removing the honeycomb and braze from the substrate, whereby the substrate may be reused.

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REMARKS

After an Appeal Brief was filed October 23, 1998, prosecution of the present application was reopened and new grounds of rejection set forth in the Office Action mailed August 15, 2000. Applicant replies under 37 CFR 1.113 with Amendment under Rule 1.116 and submits herewith a Declaration under 37 CFR 1.132 traversing the new grounds of rejection.

Claims presented for prosecution in this Application are 1-8. Claims 1-8 have been rejected on new grounds over cited prior art.

Claim 1 has been amended to more particularly point out the novelty of the present invention. (Applicant notes that Exhibit B to the Appeal Brief filed Oct. 23, 1998 contains a typographical error in Claim 1. "whereby the liquid stream may be revised" should be "whereby the substrate may be reused.")

Claims 2-8 depend from and incorporate all of the limitations of independent Claim 1.

In view of the above Amendment, Applicant's Declaration submitted herewith and the remarks below, Applicant respectfully submits that claims 1-8 are now in condition for allowance. Accordingly, Applicant respectfully requests that the present Response with Amendment and Declaration be considered and entered, the rejections to the claims be withdrawn, and that the case now be passed to issue.

The 35 U.S.C. § 103 Rejection of Claims 1-8 over the combination of McComas and Shiembob, Ryan or Ackerman.

The Examiner has rejected claims 1- 8 on the grounds that it would have been obvious to combine the liquid jet removal method of McComas with the honeycomb of



either Shiembob, Ryan, or Ackerman in order to facilitate the removal of honeycomb from a substrate. 35 U.S.C. 103(a) provides:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The teaching of McComas U.S. Patent No. 5,167,721 has been discussed in previous Responses and in Applicant's Appeal Brief. In sum, McComas specifies a method for removal of coating materials, and in particular the removal of abradable, wear resistant, and thermal barrier coating materials which have been applied by either sintering powder or fibers, or by plasma spraying, utilizing liquid jet erosion.

Ackerman, U.S. Patent No. 4,218,066, discloses an apparatus for impeding the leakage of a gaseous medium between the rotating and stationary components of a gas turbine engine. Wide channel sealing techniques are discussed in combination with honeycomb facing materials.

Shiembob, U.S. Patent No. 4,433,845, discloses the manufacture of a seal for a row of turbine blades in which the seal is a honeycomb seal and a layer of insulation is positioned in the cells of the honeycomb by flame spraying. A process for accomplishing the deposition of the insulation is also described.

In Ryan, U.S. Patent No. 4,409,054, honeycomb structures, such as those used in turbine engine abradable seals, are provided with a uniform density filling of a suitable abradable material. The abradable material is prepared as a tape preform using an organic binder. The preform is forced into the honeycomb using a rubber tool.

The Examiner states that *"it would have been obvious to the ordinary artisan at the time of the instant invention to apply the liquid removal method of McComas to the abradable honeycomb seals of either Shiembob, Ryan or Ackerman in order to facilitate easy removal of the honeycomb and braze without damaging the substrate"*

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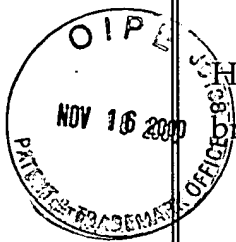
Applicant respectfully requests reconsideration and submits herewith a Declaration in accordance with 37 CFR 1.132, signed by inventor Clifford Mitchell traversing the rejection.

The McComas patent specifies "the removal of coating materials, and specifically to the removal of abradable, wear resistant, and thermal barrier coating materials, *which have been applied by either sintering powder or fibers, or by plasma spraying...*" (emphasis added) (See Technical Field, McComas)

There is no hint or suggestion that the removal method of McComas is applicable to *any* other material, let alone honeycomb. Applicant has amended independent claim 1 to make it clear that the honeycomb material of the present invention is a metal. As noted in Applicant's Declaration, honeycomb that is brazed onto a substrate generally has significantly higher erosion characteristics than the sprayed and sintered coatings described in McComas patent. Because of the much higher erosion characteristics for honeycomb, one skilled in the art would not use the method of McComas, - which was designed to remove plasma, rubber, fiber metal and epoxy materials from nickel, steel, titanium and aluminum substrate materials - for metal honeycomb removal.

Prior to the introduction of water jet processes to remove abradable seals, sprayed and sintered coatings were generally removed either by chemically stripping the material, - immersing it into a tank of solvent, - or by grit blasting. Metal honeycomb seal material, in contrast, with its significantly higher erosion characteristics, had to be removed using a chisel or by grinding it off. Due to the different erosion characteristics between honeycomb and sintered or sprayed barrier coating materials, which difference was well understood in the art, it was not obvious that the new method described in the McComas patent could be applied to honeycomb removal.

In fact, as indicated in the Declaration submitted herewith, after two years of experimentation with the use of ultra-high pressure water on honeycomb, the process yielded unacceptably low removal rates, (approx. .005 inches per second @ 55,000 psi).



Honeycomb was only partially removed. The wicked areas of the honeycomb and the braze could not be removed with high-pressure liquid.

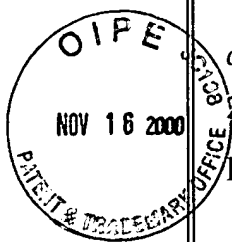
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As indicated in Applicant's Declaration, further extensive experimentation was required to demonstrate acceptable removal rates of Hastelloy X (AMS 5536) honeycomb material and nickel-chrome braze on Hastelloy X. Applicant points out that the claims at issue in the present case are directed *specifically* to metal honeycomb and braze removal as clearly indicated in the newly amended independent claim.

If the Examiner chooses to utilize McComas in a new 35 U.S.C. § 103 rejection, Applicant respectfully requests that the Examiner provide an Affidavit or other evidence per MPEP § 2144.03, to support Examiner's contention that *"it would have been obvious to the ordinary artisan at the time of the instant invention to apply the liquid removal method of McComas to the abradable honeycomb seals of either Shiembob, Ryan or Ackerman in order to facilitate easy removal of the honeycomb and braze without damaging the substrate ..."*

Applicant earnestly believes that independent claim 1 clearly defines over McComas in combination with either Shiembob, Ryan, or Ackerman. With particular respect to dependent claims 2-8 Applicant asserts that claims 2-8 themselves contain allowable subject matter as well as being allowable at least for the reasons that independent claim 1 is allowable, as discussed above. Therefore, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103 rejection of claims 1-8.

Finally, with respect to the Examiner's statement that McComas teaches a method of removal of coatings, *"including the inherent step of having the liquid stream striking the substrate at the base of the coating, since, inter alia, this striking position is the obvious position that facilitates simultaneous removal of the coating and bond coating from the substrate, ..."* Applicant respectfully urges that McComas does not teach simultaneous removal of the top coating and bond coating by having the liquid strike the substrate at the base of the coating. To the contrary, McComas Independent Claim 1 specifically teaches sequential removal of the top coat and bond coat. See McComas Claim 1 step d. *"causing the liquid to strike the top coat, wherein the liquid striking the top coat causes top*



coat erosion until the bond coat is exposed.". With reference to the Appeal Brief filed Oct. 23, 1998, Applicant reiterates that no combination of references teach or suggest positioning the pressurized liquid to strike the substrate at the base of the honeycomb.

CONCLUSION

In view of the Amendment to Independent Claim 1, the Declaration submitted herewith and the remarks above, it is respectfully submitted that claims 1-8 are allowable, and an early action to that effect is earnestly solicited.

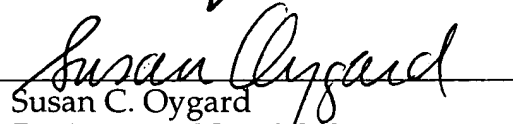
The Examiner is invited to contact the undersigned at the number below to expedite resolution of any issues that the Examiner may consider to remain unresolved. In particular, should a Notice of Allowance not be forthcoming, the Examiner is requested to phone the undersigned for a telephonic interview while the outstanding issues are fresh in the mind of the Examiner.

In the event that the Examiner is not persuaded by the arguments and Amendment set forth herein, Applicant respectfully request that this response with Amendment and Declaration be admitted for purposes of placing the application in better condition for appeal to the Board of Appeals.

It is believed that no additional fees or deficiencies in fees are owed. However, authorization is hereby given to charge our Deposit Account No. 13-0235 in the event any additional fees are owed.

Respectfully submitted,

By


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